Presented is one of a series of resource guides designed to provide students with an improved mathematics program. This guide emphasizes real-life situations focusing on the operation of a store. Classes are divided into grocery, meat, produce, drugs, and hardware sections at the beginning of the course. Students learn how to organize, collect, and use data as they work through the program. Topics covered include the purchasing and pricing of goods, bookkeeping, tabulating expenses, and finding individual student grade averages at the completion of the course. The bulk of this document is a collection of worksheets designed to help students through individual mathematics laboratory experiences. The intent is to provide teachers with materials and guidelines to structure a course for secondary students that develops basic mathematical skills and concepts through application of "operating a store" experiences.
SELECTED MATHEMATICS APPLICATIONS (LEVEL A)

Operating A Store
The Honorable George R. Arlyoshi  
Governor, State of Hawaii  

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In 1978 the Mathematics Program Guide, K-12 was developed and disseminated to all public schools in Hawaii "to provide direction for teachers and administrators in the development of school-level mathematics." One of the major outcomes of this effort was a substantial strengthening of the quantity and quality of the secondary mathematics program. Existing courses in grades 9-12 were restructured and several new courses were created. Selected Mathematics Applications (Levels A and B) is a series of new courses which are designed to emphasize development of basic mathematics skills and concepts in the areas of arithmetic, geometry, measurement, and problem-solving through application to "real-life" situations such as business, consumerism, industry, and the trades.

This document is one of a series of Selected Mathematics Applications course guides. In this guide the real-life situation of "operating a store" will provide students with numerous opportunities to develop an in-depth knowledge of mathematical concepts and skills in the aforementioned areas. Applications to the general management of a store, purchasing and pricing of goods, bookkeeping, and accounting for expenses and profits will furnish topics for these opportunities.

The intent of this course guide is to provide teachers with guidelines and materials in order to structure a course that would teach students mathematical content through the application to "Operating A Store".

Charles G. Clark
Superintendent of Education
ACKNOWLEDGMENT

We gratefully acknowledge those teachers who critically evaluated the draft manuscript of this Guide. Their suggestions for improvement of the Guide are appreciated.

Special recognition is extended to Elizabeth Brown, Mathematics Teacher, Waialua High School, who developed and piloted the draft of this course guide.
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INTRODUCTION

This course guide uses the business point of view approach to develop basic mathematics skills and concepts. To initiate activities in the course, teachers should divide the class into four departments -- GROCERY, MEAT, PRODUCE, and DRUGS AND HARDWARE -- by having each student select a department. Depending on class size, guide the student selections so that the departments will have approximately equal numbers of students. Learning activities for each department will follow the guidelines outlined by the units in this guide.

While working through this guide, keep in mind the eight Foundation Program Objectives and the fifteen Essential Competencies that are the guidelines for developing the educational program of the State of Hawaii. Make good use of community resources, the newspaper, and the telephone directory.

Listed below is a suggested time frame that can be used for the course.

Unit I  - Orientation, 1 week
Unit II - Purchasing and Pricing of Goods, 6 weeks
Unit III - Bookkeeping, 5 weeks
Unit IV - Expenses, 5 weeks
Unit V  - Summarization, 1 week

ORGANIZATION

The guide contains five units. Each unit lists the learner objectives from the Mathematics Program Guide that pertain to that unit. (A summary of learner objectives and their matching units appears in Table I.) Every unit except for the Orientation and the Evaluation units is broken into sections which may include review of necessary computational skills covered in that
particular section, resources for that section, and suggested activities for that section. Most of the activities will be research-suggested homework assignments utilizing community resources. Other activities will pertain to the mechanics of "operating a store". Following the suggested activities are reproducible student worksheets that can be used for that section. Each worksheet has a heading which identifies its related unit and section and space for student's name, date, and period. Appropriate directions are also provided.
<table>
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<td>Adds</td>
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<td>Subtracts</td>
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<td>Identifies and Names</td>
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<td>Organizes Into Deductive System</td>
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<td>Uses Inductive Procedures</td>
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<tr>
<td>Organizes and Analyzes Data</td>
</tr>
<tr>
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<tr>
<td>Uses Deductive Arguments</td>
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</table>
UNIT 1 ORIENTATION
(1 week)

A. Learner Objectives

1. Understands the concept of percent, particularly 100%.
2. Is curious about everything new and asks questions which clarify, relate, or extend ideas.
3. Acquaints oneself with community resources.

B. Pre Test - Administer the Stanford Diagnostic Mathematics Test as a pre test.

C. Class Requirements -- Teachers should discuss with their students what is required of them in terms of attendance, attitude, assignments (class and homework, quizzes, and tests), and notebook.

Every class should start with orientation to set some ground rules. The majority of students like to know your grading system. Use this time to introduce the concept of 100% and finding averages.

Base each requirement on 100 points for easier computation.

Students like to figure out what they can get for a grade if they score certain numbers. For example:

<table>
<thead>
<tr>
<th>GRADING SYSTEM</th>
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<tbody>
<tr>
<td>90-100 = A</td>
</tr>
<tr>
<td>80-89 = B</td>
</tr>
<tr>
<td>70-79 = C</td>
</tr>
<tr>
<td>60-69 = D</td>
</tr>
<tr>
<td>59-Below = F</td>
</tr>
</tbody>
</table>
A student may score accordingly:

<table>
<thead>
<tr>
<th>Attendance</th>
<th>100</th>
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</thead>
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<tr>
<td>Class/Homework Average</td>
<td>72</td>
</tr>
<tr>
<td>Quiz Average</td>
<td>59</td>
</tr>
<tr>
<td>Quarter Test</td>
<td>65</td>
</tr>
<tr>
<td>Notebook</td>
<td>95</td>
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</tbody>
</table>

301 + 5 = 78 (C)

Use the following samples and worksheets for some of the suggested activities.

D. Use of the Telephone and Directory -- Teachers should use the directory to locate part of Oahu by using the prefix of a telephone number, to find the zip codes of Honolulu and other communities, to find the zip code from the street address, and to compute cost of making a phone call.

Use the following samples and worksheets for some of the suggested activities.
UNIT I B  Class Requirements

Directions: Compute the average and give a letter grade for each of the students below:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Attendance</td>
<td>Attendance</td>
<td>Attendance</td>
<td>Attendance</td>
</tr>
<tr>
<td></td>
<td>95</td>
<td>50</td>
<td>85</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Class/homework</td>
<td>63</td>
<td>Class/homework</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Quiz average</td>
<td>73</td>
<td>Quiz average</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Quarter test</td>
<td>53</td>
<td>Quarter test</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Notebook</td>
<td>90</td>
<td>Notebook</td>
<td>95</td>
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<table>
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<tr>
<th></th>
<th>92</th>
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<th>92</th>
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<tbody>
<tr>
<td></td>
<td>53</td>
<td>80</td>
<td>53</td>
<td>55</td>
</tr>
</tbody>
</table>
UNIT I D  Use of the Telephone and Directory

Objective: To use the directory to locate part of Oahu by using the prefix of a telephone number.

Directions: Turn to page 12A in the green section of your 1979 telephone directory and find the city which corresponds to the prefixes of telephone numbers.

Example: 637 Waialua
638 Sunset Beach

1. 438
2. 235
3. 922
4. 293
5. 395
6. 487
7. 941
8. 737
9. 671
10. 841

11. 839
12. 456
13. 521
14. 471
15. 536
16. 696
17. 848
18. 546
19. 373
20. 668

21. 988
22. 955
23. 677
24. 621
25. 623
UNIT I D Use of the Telephone and Directory

Objective: To familiarize oneself with the areas of Oahu and their prefixes.

Directions: Locate the area of the cities listed below and list one prefix for the area. Use the map on the next page.

Example: Waialua 637 (shown on the map)

1. Kaneohe
2. Waianalao
3. Puunui
4. Waipahu
5. Nanakuli
6. Kailua
7. Sunset Beach
8. Koko Head
9. Ewa
10. Makaha
11. Kaaawa
12. Kalihi
13. Mililani
14. Aina Haina
15. Waianae
16. Kahalu
17. Ewa Beach
18. Barber's Pt.
19. Makakilo
20. Pearl City
21. Manoa
22. Kaimuki
23. Aiea
24. Wahiawa
25. Laie
26. Punahou
27. Pearl Harbor
28. Schofield
29. Hickam
30. Tripler
UNIT I D  Use of the Telephone and Directory

Objective: To familiarize oneself with the areas of Oahu and their first digit prefix.

Directions: Label the section of the island by the first digit prefix; 2, 3, 4, 5, 6, 7, 8, 9.
OBJECTIVE: To familiarize oneself with the Oahu Post Offices and Zip codes.

Directions: Label each section and write its zip code.

AIEA __________ KAHUKU __________
EWA BEACH __________ KAILUA __________
HALEIWA __________ KANEHOE __________
HAUULA __________ KUNIA __________
HONOLULU __________ LAIE __________
KAAAWA __________ MILILANI TOWN __________
PEARL CITY __________ WAIALUA __________
WAHIWA __________ WAIANAE __________
WAIMANALO __________ WAIPAHU __________
Use your 1979 Oahu Telephone Directory (page 19A) to find the boundaries for each section of the Honolulu area and write in the zip codes for each section. (Honolulu, Hawaii, 968 + Two digits Shown = Zip Code)
UNIT I D Use of the Telephone and Directory

Objective: To use the 1979 telephone directory to find complete mailing addresses.

Directions: Oahu street and zip code guides are found on pages 20A-31A. Find the name of the person or company in the white or yellow pages, then use the guide in the green pages to find the post office and zip code.

Example: Moto Aki (first name on page 25)
719 K N. School (page 30A)
Honolulu, HI, 96817

Use your telephone directory and find the complete mailing address for the first name on the following pages:

30, 40, 50, 100, 125, 200, 250, 300, 325, 333, 350, 421, 447, 509, 559, 581, 650, 653, 663, 667
UNIT I D Use of the Telephone and Directory

Objective: To use the telephone directory to compute the cost making a long distance phone call.

Directions: Use pages 2A and 3A to compute long distance calls.

Example: Direct Dial to Texas on Monday at 8:15 AM and conversed for 30 minutes.
Texas is in Band 2.
Direct Dial at 8:15 AM Monday is 77c for the first minute and 59c each additional minute.

\[
\begin{array}{c|c}
.59 & \text{17.11} \\
\times 29 & + .77 \\
\hline
531 & \text{17.88 + tax} \\
\hline
118 & \\
\hline
\end{array}
\]

Compute the cost of each of the following calls.

(1) Direct Dial to New York at 6:15 AM on Saturday and talked for 30 minutes.
(2) Operator assisted to Las Vegas at 3:30 PM on Wednesday and talked for 30 minutes.
(3) Operator assisted to Mrs. Brown at XYZ Company in Minnesota at 6:30 AM and talked for 30 minutes.
(4) Direct Dial to Lihue, Kauai at 12 noon on Tuesday and talked for 30 minutes.
(5) Direct Dial to Denver, Colorado at 6:00 AM on Sunday and talked for 30 minutes.
(6) Direct Dial to Alaska at 12 noon on Saturday and talked for 30 minutes.
(7) How much money could you save if you used direct dialing in problem number 2?
(8) How much money could you save if you used direct dialing in problem number 3?

(9) What day of the week is the least expensive to make a phone call?

(10) What point determines the rate for a phone call?
UNIT II  PURCHASING AND PRICING OF GOODS
(6 weeks)

A. Learner Objectives

1. Organizes and analyzes data by constructing simple graphs or tables.
2. Reads and interprets charts, maps and graphs.
3. Collects and classifies selected data.
4. Makes measurements using a ruler in both customary and metric units.
5. Recognizes and draws common solids.
6. Recognizes and constructs triangles, squares, circles, rectangles
   and other polygons.
7. Estimates length, area and volume of plane and solid figures.
8. Understands and uses the relationship among common fractions,
   decimal fractions, and percents.
9. Multiplies and divides decimals.
10. Understands and uses ratios and proportions.
11. Rounds numbers to a designated value.

B. Selection of Goods -- In this section, students learn to make wise
    decisions regarding what goods should be sold in their store. They
    learn about customer preferences, they learn to do research about what
    other similar stores offer, and finally they learn what to consider in
    their final decision of what stock their store should have. Make good
    use of the local grocery stores in your community. The managers are
    very helpful and appreciate the teacher's visit before sending the
    students on their homework assignments.
1. Review of Skills Needed

Constructing and reading of bar, circle, broken-line, and picture graphs.

2. Resources


b. Bolster, MATHEMATICS IN LIFE, Pages 238-244.

c. Brown, GENERAL MATH Bk 1, Pages 259-290.

d. Brown, GENERAL MATH Bk 2, Pages 39-61.

e. Brown, INTRODUCTION TO HIGH SCHOOL MATH, Pages 253-290.

f. Dublin, BUSINESS MATHEMATICS, Pages 61-65.

g. Kinney, GENERAL MATHEMATICS, Pages 202-223.

h. Shaw, GENERAL MATH I, Pages 262-275.

i. Wiebe, FOUNDATIONS OF MATHEMATICS, Pages 463-479.

3. Suggested Activities

Use the following samples and worksheets:
UNIT II B Selection of Goods

Objective: To make a list of all or as many items as possible in your department.

Directions: Go to the grocery store and make an alphabetical list of all the items in your department. Cut a ditto master of the list and run off about 20 copies for future use.

Example: Grocery Department

Canned Vegetables

Asparagus
Beans - Cut Green
  French
Beets
Corn - Cream
  Kernel
Lima Beans
Mixed Vegetables
Mushrooms - Buttons
  Stems & Pieces
Peas
Peas and Carrots
Sauerkraut
Spinach
Tomato - Catsup Sauce Whole
  Paste Stewed
Whole New Potatoes
Yams
UNIT II B Selection of Goods

Objective: To interview and make a tally chart of people's preference of items in your department.

Directions: Use your list and interview 30 people. With each person, inform him/her that you are working on a project and would he/she help by answering yes, if the item is in the home; or, no if the item is not in the home. For every yes, make a tally mark (/) by the item.

Example: Samples 1 & 2.
## CANNED VEGETABLES

<table>
<thead>
<tr>
<th>Item</th>
<th>Code</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asparagus</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Beans - Cut Green</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>French</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Beets</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Corn - Cream</td>
<td>20</td>
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<tr>
<td>Kernel</td>
<td>30</td>
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</tr>
<tr>
<td>Lima Beans</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Mixed Vegetables</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Mushrooms - Button</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Stem &amp; Pieces</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Peas and Carrots</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Sauerkraut</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Spinach</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Tomato - Catsup</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Paste</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Sauce</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Stewed</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Whole</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Whole New Potatoes</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yams</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>
CEREALS

All Bran
Apple Jack
Cheerios
Cocoa Krispies
Corn Flakes
Corny Snaps
Cracklin Bran
40% Bran
Froot Loops
Frosted Flakes
Frosted Mini Wheats
Frosted Rice
Handi-Pak
Jumbo Assortment
Most
Product 19
Quaker Oats (Quick)
Raisin Bran
Rice Krispies
Snack Pack
Special K
Sugar Corn Pops
Sugar Smacks
Toasted Mini Wheat
Total
Trix
Wheaties
Variety Pack
UNIT II B  Selection of Goods

Objective: To construct a bar graph.

Directions: Construct a bar graph of the ten most popular items.
Example: See Graphs 1 & 2.
Bar Graph of Ten Most Popular Canned Vegetables

- Cream Corn
- Kernel Corn
- Cut Beans
- Mushroom Stems & Pieces
- Peas and Carrots
- Tomato Catsup
- Tomato Paste
- Tomato Sauce
- Stewed Tomatoes
- Yams
Number of Students

- Corn Flakes
- Frosted Flakes
- Handi-Pak
- Jumbo Assortment
- Quaker Oats (Quick)
- Raisin Bran
- Rice Krispies
- Shredded Wheat
UNIT II B Selection of Goods

Objective: To compare the students' graphs of popular items with the grocery stores' popular items.

Directions: Use a prepared ditto sheet and go to the grocery store. Record the different sizes of each item and count the number stocked for each item.

Example: Cereals

<table>
<thead>
<tr>
<th>Item</th>
<th>18 oz.</th>
<th>12 oz.</th>
<th>8 oz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn Flakes</td>
<td>10 boxes</td>
<td>12 boxes</td>
<td>15 boxes</td>
</tr>
<tr>
<td>Froot Loops</td>
<td>15 oz.</td>
<td>11 oz.</td>
<td>7 oz.</td>
</tr>
<tr>
<td></td>
<td>12 boxes</td>
<td>8 boxes</td>
<td>15 boxes</td>
</tr>
</tbody>
</table>

Is there a correlation between your graph and the items stocked in your grocery store?
UNIT II B Selection of Goods

Objective: To make a decision using collected data.

Directions: Make a list of ten items you would select to put on your grocery shelf. Bring each item to class.

Example: Canned Vegetables
- Cream Corn
- Kernel Corn
- Cut Beans
- Mushrooms - Stems & Pieces
- Peas & Carrots
- Tomato Catsup
- Tomato Paste
- Tomato Sauce
- Stewed Tomatoes
- Yams
UNIT II B Selection of Goods

Objective: To keep a record of selected items.

Directions: Make an inventory of selected items in your department and cut a ditto master to keep for future use.

<table>
<thead>
<tr>
<th>Example: Canned Vegetables</th>
<th>Amount Needed</th>
<th>On hand</th>
<th>Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cream Corn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canned Soups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicken Noodle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canned Meat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spam</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example: Canned Vegetables

- Cream Corn

Example: Canned Soups

- Chicken Noodle

Example: Canned Meat

- Spam
C. Location of Wholesale Vendors -- In this section, students learn to use the telephone directory as a reference for getting addresses for wholesale vendors. Then they have to use a map to locate the actual location of the vendor.

1. Review of Skills Needed
   a. Use of the yellow pages
   b. Use of the green pages/zip codes from street addresses
   c. Map reading

2. Suggested Activities
   Use the following worksheets:
UNIT II C  Location of Wholesale Vendors

Objective: To acquire the telephone number and address for wholesale vendors.

Directions: Use the yellow pages of the telephone directory and make a list of companies, addresses and phone numbers needed for future reference.

Example: GROCERY DEPARTMENT

Grocers - Wholesale
Certified Corporation
2888 Ualena
Honolulu, 96819
Phone: 836-0488
UNIT II C Location of Wholesale Vendors

Objective: To familiarize oneself with the location of the wholesale vendors.

Directions: Acquire a map of Honolulu and the various districts. Locate each vendor on the map.
D. Pricing the Goods -- In this section, students learn to find the wholesale and retail cost of selected items. They also learn how to find the unit cost of an item (from the wholesale and retail prices) and how to find the percent of markup of an item from wholesale to retail.

1. Review of Skills Needed
   a. Percent
      1) Meaning
      2) Interchanging percent and decimals
      3) Using percents
      4) Finding what percent one number is of another number
      5) Finding a number from its percent of another number
      6) Finding the original price
      7) Finding a part of a number
      8) Finding a number from its part

   b. Decimals
      1) Meaning
      2) Multiply
      3) Divide

2. Resources
   a. Percent
      1) Berstein, TROUBLE-SHOOTING MATHEMATICS SKILLS, Pages 310-329.
      2) Bolster, MATHEMATICS IN LIFE, Pages 213-223.
3) Brown, GENERAL MATHEMATICS Bk I, Pages 213-239.
4) Brown, GENERAL MATHEMATICS Bk 2, Pages 113-120.
5) Brown, INTRODUCTION TO HIGH SCHOOL MATHEMATICS, Pages 213-239.
6) Couzins, ESSENTIAL OF MATHEMATICS, Pages 308-339.
7) Kinney, GENERAL MATHEMATICS, Pages 344-373.

b. Decimals
1) Berstein, TROUBLE-SHOOTING MATHEMATICS SKILLS, Pages 116-144.
2) Bolster, MATHEMATICS IN LIFE, Pages 83-104.
3) Brown, GENERAL MATHEMATICS Bk I, Pages 143-158, 161-164.
4) Brown, GENERAL MATHEMATICS Bk 2, Pages 176, 185-189.
5) Couzins, ESSENTIAL OF MATHEMATICS, Pages 222-257.
7) Shaw, GENERAL MATH I, Pages 54, 55, 58-63, 86-89.
8) Shea, WORKING WITH NUMBERS, Pages 56-60, 66-76.

3. Suggested Activities

Use the following worksheets:
UNIT II D Pricing the Goods

Objective: To find the cost of selected items.

Directions: Use your ditto sheet, cross out the items you are not using in your grocery store. Go to a supermarket and price each size for each item.
Example: See Sample 3.

Go to a neighborhood store and price each size for each item. Write none if the item is not in the store.
<table>
<thead>
<tr>
<th>CEREALS</th>
<th>Size</th>
<th>Price</th>
<th>Size</th>
<th>Price</th>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Jack</td>
<td>15 oz.</td>
<td>$2.09</td>
<td>11 oz.</td>
<td>$1.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheerios</td>
<td>10 oz.</td>
<td>$1.19</td>
<td>7 oz.</td>
<td>$.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn Flakes</td>
<td>18 oz.</td>
<td>$1.39</td>
<td>12 oz.</td>
<td>$1.05</td>
<td>8 oz.</td>
<td>$.75</td>
</tr>
<tr>
<td>Froot Loops</td>
<td>15 oz.</td>
<td>$1.89</td>
<td>11 oz.</td>
<td>$1.49</td>
<td>7 oz.</td>
<td>$.99</td>
</tr>
<tr>
<td>Frosted Flakes</td>
<td>15 oz.</td>
<td>$1.49</td>
<td>10 oz.</td>
<td>$1.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product 19</td>
<td>17 oz.</td>
<td>$1.99</td>
<td>12 oz.</td>
<td>$1.59</td>
<td>8 oz.</td>
<td>$1.09</td>
</tr>
<tr>
<td>Quaker Oats (Quick)</td>
<td>42 oz.</td>
<td>$1.69</td>
<td>18 oz.</td>
<td>$.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raisin Bran</td>
<td>25 oz.</td>
<td>$2.19</td>
<td>15 oz.</td>
<td>$1.49</td>
<td>11 oz.</td>
<td>$1.19</td>
</tr>
<tr>
<td>Rice Krispies</td>
<td>16 oz.</td>
<td>$1.75</td>
<td>10 oz.</td>
<td>$1.19</td>
<td>6 oz.</td>
<td>$.77</td>
</tr>
<tr>
<td>Special K</td>
<td>15 oz.</td>
<td>$1.89</td>
<td>11 oz.</td>
<td>$1.49</td>
<td>7 oz.</td>
<td>$.99</td>
</tr>
</tbody>
</table>
UNIT II D Pricing the Goods

Objective: To find the wholesale price of some items.

Directions: Call a wholesale company, identify yourself as a student working on a class project and ask if they can help you with some information. If the company will not help you, say "Thank You" and hang up courteously. If the company will help, select five items from your list and inquire how the items are sold and the price of the items. Be sure to thank the person for his/her time.

Example: Apple Jack
15 oz.- 24/cs $36.00
11 oz.- 24/cs $24.00
UNIT II D Pricing the Goods

Objective: To compute the unit cost of wholesale price of some items.

Directions: Use the price from the wholesale company and compute unit cost.

Step 1: Compute cost per item. Divide the number of items into cost.

\[
\begin{array}{c}
1.50 \\
36.00 \\
24 \\
120 \quad 0 \\
120 \quad 0 \\
\end{array}
\]

\$1.50

Step 2: Compute unit cost per item, round to the nearest tenth of a cent.

\[
\begin{array}{c}
.10 \\
15 \\
1.5 \\
0 \\
0 \\
\end{array}
\]
UNIT II D Pricing the Goods

Objective: To find the percent of mark up of each item.

Directions: To find the mark up of each item, divide the wholesale unit price into the retail unit price of each item. Change the decimal to percent. Subtract 100% from your answer to get the percent of mark up.

Example: Retail unit cost 13.9¢
Wholesale unit cost 10.0¢

\[
\frac{1.39}{10} = 139\%
\]

\[
\begin{array}{c}
10)13.90 \\
10 \\
3 9 \\
3 0 \\
90
\end{array}
\]

139 %

\[
\frac{-100\%}{39\%} \text{ mark up}
\]
UNIT II D Pricing the Goods

Objective: To compute unit cost of selected items.

Directions: Use the previous worksheets and compute the unit cost of each size of item by dividing the size into the price of the item. Round off the answer to the nearest tenth of a cent.

Example: Apple Jack 15 oz 11 oz

\[
\begin{align*}
\text{Apple Jack} & \quad 15 \text{ oz} & \quad 11 \text{ oz} \\
& \quad \$2.09 & \quad \$1.69 \\
\end{align*}
\]

\[
\begin{align*}
\frac{1393}{15} \, \text{oz} & = 13.9 \, \text{c/oz} \\
\frac{1536}{11} \, \text{oz} & = 15.4 \, \text{c/oz} \\
\end{align*}
\]
E. Measuring the Goods -- In this section, students will learn how to measure the goods to determine how much space is needed for each item in English and metric measure. They will find the total area needed to stock selected items and they will find the volumes of selected items in both English and metric measure.

1. Review of Skills Needed

   a. Fractions
      1) Meaning
      2) Finding equivalent fractions
      3) Simplifying fractions
      4) Multiplying
      5) Dividing

   b. Measurement
      1) Reading a ruler and meter
      2) Obtaining approximate length
      3) Using common measures
      4) Computing area
         a) Quadrilaterals
         b) Circles
         c) Triangles
         d) Other polygons
      5) Computing volume
         a) Cubes
         b) Cylinder
         c) Pyramids
d) Sphere

e) Prisms

f) Cones

2. Resources

a. Fractions

1) Bernstein, TROUBLE-SHOOTING MATHEMATICS SKILLS, Pages 195-209, 228-244.

2) Bolster, MATHEMATICS IN LIFE, Pages 131-150.

3) Brown, GENERAL MATHEMATICS Bk 1, Pages 119-169.

4) Brown, GENERAL MATHEMATICS Bk 2, Pages 153-168.

5) Brown, INTRODUCTION TO HIGH SCHOOL MATHEMATICS, Pages 119-169.

6) Couzins, ESSENTIALS OF MATHEMATICS, Pages 188-221.

7) Kinney, GENERAL MATHEMATICS, Pages 116-159.

8) Shaw, GENERAL MATH 1, Pages 97-127, 161-191.

9) Shea, WORKING WITH NUMBERS, Pages 26, 27, 30, 43-53.

b. Measurement

1) Bernstein, TROUBLE-SHOOTING MATHEMATICS SKILLS, Pages 148-187.

2) Bolster, MATHEMATICS IN LIFE, Pages 323-360.

3) Brown, GENERAL MATHEMATICS Bk 1, Pages 13, 16, 119-126.

4) Brown, GENERAL MATHEMATICS Bk 2, Pages 280-345.

5) Brown, INTRODUCTION TO HIGH SCHOOL MATHEMATICS, Pages 312-327.
6) Couzins, ESSENTIALS OF MATHEMATICS, Pages 258-305.
7) Kinney, GENERAL MATHEMATICS, Pages 228-275, 312-343.
9) Shea, WORKING WITH NUMBERS, Pages 107-134.
10) Wiebe, FOUNDATIONS OF MATHEMATICS, Pages 276-438.

3. Suggested Activities

Use the following worksheets:
UNIT II E   Measuring the Goods

Objective: To find the space needed for each item in English measure.

Directions: Measure the outside of each cubic and/or cylindrical container in English measure. Using the formula $V = lwh$ or $V = \pi r^2 h$, find the space needed for each item. Round off to the nearest cubic inch.

Example: Canned Tuna

d = 3-3/8"

h = 1-3/4"

$V = \frac{22}{7} \times \frac{27}{16} \times \frac{27}{16} \times \frac{7}{2} = \frac{8019}{512} \approx 16$ cu "

...
UNIT II E  Measuring the Goods

Objective: To find the space needed for each item in metric.

Directions: Measure the outside of each cubic and/or cylindrical container in metric. Using the formula $V = lwh$ or $V = \pi r^2 h$, find the spaces needed for each item. Round off to the nearest cubic cm.

Example: Canned Tuna

- $d = 8.5$ cm
- $h = 4.5$ cm
- $V = 3.14 \times 4.25 \times 4.25 \times 4.5 \approx 255$ cm$^3$
UNIT II E    Measuring the Goods

Objective: To find area needed to stock each item.

Directions: Go to the grocery store and measure the length and width of that portion of the item touching the shelf in both English measure and metric. Do this for each of the ten items selected. Compute the total area used for each item.

Example: English measure

Apple Jacks -- 15 oz.
length -- 15 in.
width -- 18 in. (size of shelf)
Total area -- 18 x 15 = 270 sq. in.

Metric

length = 38.1 cm
width = 45.7 cm
Total area 45.7 x 38.1 = 1,741.17 cm²
UNIT II E  Measuring the Goods

Objective: To find the capacity of each rectangular or cylindrical item in English measure.

Directions: Measure the inside of each rectangular and/or cylindrical container in English measure. Using the formula $V = lwh$ or $V = \pi r^2 h$, find the capacity of the item. Round to the nearest cu in.

Example: Canned Tuna

d = 3-5/16 in.

h = 1-9/16 in.

$V = \frac{22}{7} \times \frac{53}{32} \times \frac{53}{32} \times \frac{24}{16} = 772475 \approx 13 \text{ cu in.}$

52
UNIT II E  

Measuring the Goods

Objective: To find the capacity of each rectangular or cylindrical item in metric.

Directions: Measure the inside of each rectangular and/or cylindrical container in metric. Using the formulas \( V = lwh \) or \( V = \pi r^2h \) find the capacity of the item. Round to the nearest cm\(^3\).

Example: Canned Tuna

\[
\begin{align*}
d &= 8.3 \text{ cm} \\
h &= 3.9 \text{ cm} \\
V &= 3.14 \times 4.15 \times 4.15 \times 3.9 = 211 \text{ cm}^3
\end{align*}
\]
UNIT II E     Measuring the Goods

Objective:     To find the volume of the container in both English and metric.

Directions:     Using the previous assignments, subtract the volume of the item from the volume of the space needed to find the volume of the container.

Example:     Canned Tuna  -  English

\[
\begin{align*}
16 \text{ cu } " & \quad (\text{See page } 43) \\
- 13 \text{ cu } " & \quad (\text{See page } 46) \\
3 \text{ cu } " & \\
\end{align*}
\]

Canned Tuna  -  Metric

\[
\begin{align*}
255 \text{ cm}^3 & \quad (\text{See page } 44) \\
- 211 \text{ cm}^3 & \quad (\text{See page } 47) \\
44 \text{ cm}^3 & \\
\end{align*}
\]
UNIT III  BOOKKEEPING
(5 weeks)

A. Learner Objectives

1. Adds, subtracts, multiplies, and divides whole numbers and decimals.
2. Estimates sums, differences, products and quotients.
3. Explores shortcuts in basic algorithmic operations.
4. Rounds numbers to a designated value.
5. Investigates mechanical devices for computing.
6. Understands and uses the relationship between common fractions and decimal fractions.
7. Solves simple equations in one unknown.

B. Banking Procedures -- In this section, students will learn about the various services a bank can offer. They will learn how to use the different services (such as learning how to use a checking account) and the cost of the service, if any.

1. Review of Skills Needed
   a. Checking Accounts
      1) Filling out deposit slips
      2) Writing checks
      3) Filling out check registers
      4) Reconciling a bank statement
   b. Savings Accounts
      1) Filling out deposit slips
      2) Withdrawing funds
3) Computing interest
   a) simple
   b) compound

c. Other Services

2. Resources
   a. Checking Accounts
      1) Bernstein, TROUBLE-SHOOTING MATHEMATICS, pp. 356-359.
      2) Bolster, CONSUMER AND CAREER MATHEMATICS, pp. 88-96.
      3) Brown, GENERAL MATHEMATICS Bk. 1, pp. 446-455.
      4) Brown, GENERAL MATHEMATICS Bk. 2, pp. 563-569.
      6) Goe, CONSUMER MATHEMATICS, pp. 303-316.
      8) Olson, BUSINESS AND CONSUMER ARITHMETIC, pp. 59-62.

   b. Savings Accounts
      1) Bolster, CONSUMER AND CAREER MATHEMATICS, pp. 98-103.
      3) Brown, GENERAL MATHEMATICS Bk. 2, pp. 521-533.
      6) Guthrie, BUSINESS MATHEMATICS for the CONSUMER, pp. 131-145.
3. Suggested Activities

a. Checking Accounts

1) Use 2 class periods for Buying and Selling - SWAP MEET

   a) First Day: GROCERY and MEAT departments are sellers and PRODUCE and DRUGS departments are buyers. The students are to keep records of all items sold or bought, and how they are paid for future assignments. If play money is available, use that for cash. Blank checks may be obtained from a bank, or may be made up using the department title.

   b) Second Day: PRODUCE and DRUGS departments are sellers and GROCERY and MEAT departments are buyers. Again, students are to keep records of all transactions.

2) Use the following sample worksheets

b. Savings Accounts

1) Arrange with a bank to allow your students to open a passbook savings account. If the bank is in walking distance, arrange for a field trip to the bank. Once a week, set aside 15 minutes of class time as Banking Time. At this time, students may make deposits only. Withdrawals are to be made with the bank only.

2) Use the following sample worksheets

c. Other Services - use sample worksheets
UNIT III B  Banking Procedures

Objectives:  To inquire about various checking account services.

Directions:  Go to two (2) banks and see their customer consultants.  Inquire about the following costs of checking accounts:

<table>
<thead>
<tr>
<th></th>
<th>BUSINESS:</th>
<th>PERSONAL:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service charge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost per check</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other costs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Describe the procedure for opening an account:

- Do both banks have the same available services?
- How about conveniences?
UNIT III B Banking Procedures

Objective: To learn to fill out a deposit slip for a checking account.

Directions: Use your totals from your sales at the SWAP MEET and fill in deposit slips for each transaction. Each customer is a transaction.

For deposit to the account of:

<table>
<thead>
<tr>
<th>Name</th>
<th>Sign here for less cash received</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1:1213'010'0''123450</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cash</th>
<th>Currency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coin</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
</tr>
<tr>
<td>H</td>
</tr>
<tr>
<td>E</td>
</tr>
<tr>
<td>K</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Less cash recd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>69</td>
</tr>
</tbody>
</table>

Net Deposit

1. Use personalized deposit tickets whenever possible.
2. Enter currency (FEDERAL RESERVE NOTES) and coin amounts on the deposit ticket.
3. List checks by the ABA number. Additional space is provided on the back of the deposit ticket.
4. Total the deposits and enter here.
5. If you are receiving cash as part of your deposit transaction, enter the amount here and sign for the cash received.
6. Subtract line 5 from line 4 and enter total net deposit here.
7. Enter date on date line.
8. Present the deposit slip to the teller and he/she will furnish you a receipt.
UNIT III B  Banking Procedures

Objective: To learn to write a check

Directions: Turn to page 13 in your *Programmed Math, Book II - Advanced Personal Math and continue the program to page 34.

UNIT III B  Banking Procedures

Objective:  To write checks

Directions: Use your totals from your purchases at the SWAP MEET and pay each department with checks. Make a separate check for each transaction.
UNIT III B  Banking Procedures

Objective: To learn to keep a check register and reconcile a bank statement.

Directions: Turn to page 35 in your *Programmed Math Book II - Advanced Personal Math and continue the program to page 54.

UNIT III B Banking Procedures

Objective: To compute costs of business checking accounts.

Directions: Use these charges to compute the service charge for a business account.

- $2 per month
- $0.75 for each check
- $0.12 credit for each $100 average monthly balance

Example: XYZ Company wrote 15 checks for the month of August and had an average monthly balance of $236. What was the service charge for August?

\[
\begin{align*}
\text{service charge for August} &= \$2.00 + 0.075 \times 15 \\
&= \$2.00 + 1.125 \\
&= \$2.125 \times 15 \\
&= 31.875 \approx \$31.88
\end{align*}
\]

1. ABC Solar System wrote 21 checks for the month of September and had an average monthly balance of $1,036. What was the service charge for September?

2. Alphabet Soup Company wrote 13 checks for the month of May and had an average monthly balance of $802. What was the service charge for May?

3. Math Apple Company paid their 120 employees by checks for the month of February and had a balance of $1,236 to pay the following companies on February 28:
   - Core Company $48.00
   - Seed Company $386.00
   - Sweet Limited $94.20
What was the service charge for the month of February if their average monthly balance was $2,048?

4. Numbers Company did not write any checks for the month of April and had an average monthly balance of $160. What was the service charge for April?
UNIT III B Banking Procedures

Objective: To compute costs of personal checking accounts.

Directions: Use these charges to compute the service charge for personal accounts.

$2.00 a month
No Charge: Maintain a $100 average monthly balance
          Direct deposit of your paycheck
$2.50 one time charge to order unique design checks.

Example: Albert Bank wrote 15 checks for the month of June
and had an $89 average monthly balance. What was his
service charge for the month of June? $2.00

1. Dean Surfer deposits $100 into his checking account each
time he cashes his check. During the month of October he
wrote 10 checks and maintained a $110 average monthly balance.
What was his service charge for the month of October?

2. Boogie Consumer has his government check assigned to his
bank. In November he paid all of his bills with his surfer
design checks. What was his service charge for November?

3. Master Savings has his Social Security check sent to the
bank every month. On February 2nd, he found that he was
running low on checks so he ordered the eagle design checks
and received them on February 15. He wrote 8 checks and
maintained a $150 monthly average balance. What was his
service charge for February?
UNIT III B  Banking Procedures

Objective: To inquire about various savings plans.

Directions: Go to two (2) banks and see their customer consultants. Inquire about various savings plans and the interest rates.

- Passbook Savings Account:
- Fixed-time Savings Account:
- Time Certificates of Deposit:
- Bank Bonds:
- Savings Bonds:
- Christmas Club:
- Others:
UNIT III B  Banking Procedures

Objective:  To inquire about other services a bank may offer.

Directions:  Go to two (2) banks and see their customer consultants.

Inquire about what services other than checking and savings accounts the bank may offer:

Automatic banking:

Pass card:

Loans:

Mortgage:

Trust:

Others:
C. Accounts Receivable -- In this section, the students will learn to tabulate and record the monies received daily. These monies are called daily receipts.

1. Review of Skills Needed -- Keeping the daily receipts provides a means of keeping track of the accounts receivable.

2. Resources
   a. Bolster, CONSUMER AND CAREER MATHEMATICS, pp. 328-331
   b. Daily newspapers: preferably Wednesdays
      1) Honolulu Advertiser
      2) Honolulu Star-Bulletin

3. Suggested Activities
   a. Use the records from Buying and Selling days to tabulate daily receipts.
   b. Use the newspaper to tabulate daily receipts -- see worksheet that follows.
UNIT III C Accounts Receivable

Objective: To tabulate and record monies received.

Directions: Use the foods section of your daily newspaper and select 15 items to purchase. List them and record the amount needed to purchase the items. Be sure to add the 4% State sales tax.

Each student do 5 purchases, each total is a daily receipt, and fill out deposit slips.

Keep for future use.
D. Accounts Payable -- In this section, the student will learn about "invoices". They will learn to read and write purchase authorization and invoice forms. They will learn about wholesaler's cash discounts and how to compute the actual cost of buying on "credit". They will find the interest rate and interest charge using the simple interest formula and how to compute monthly payments on loans.

1. Review of Skills Needed

   a. Invoice
      1) Filling in purchase orders
      2) Buying retail
      3) Buying wholesale
      4) Paying on terms

   b. Consumer Credit
      1) Using credit cards
      2) Using charge accounts
      3) Buying on installment
      4) Using credit unions
      5) Financing companies

2. Resources

   a. Invoice
      1) Dublin, BUSINESS MATHEMATICS, pp. 75-79
      2) Guthrie, BUSINESS MATHEMATICS for the CONSUMER, pp. 121-130.
      3) Meyer, CONSUMER AND BUSINESS MATHEMATICS, pp. 1-18
      4) Olson, BUSINESS and CONSUMER ARITHMETIC, pp. 113-120
b. Consumer Credit

1) Bolster, CONSUMER and CAREER MATHEMATICS, pp. 108-126
2) Brown, GENERAL MATHEMATICS Book 2, pp. 577-585
3) Dublin, BUSINESS MATHEMATICS, pp. 128-131
4) Guthrie, BUSINESS MATHEMATICS for the CONSUMER, pp. 155-164
5) Goe, CONSUMER MATHEMATICS, pp. 241-282
6) Olson, BUSINESS and CONSUMER ARITHMETIC, pp. 113-120

3. Suggested Activities
   a. Invoicing

      1) Make a class purchase order to use for making purchases from wholesale companies.
      2) Inventory goods and fill out purchase orders to restock.
      3) Make a class invoice for class use.
      4) Use the following sample worksheet.

   b. Consumer Credit - use the following worksheets
**UNIT III D Accounts Payable**

**Objective:** To read and write purchase authorization forms.

**Directions:** Take an inventory of goods in your department.

Fill out a purchase order to restock the goods.

<table>
<thead>
<tr>
<th>Example:</th>
<th>Department</th>
<th>Purchaser</th>
<th>Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Items</th>
<th>Unit Cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>cs. Passion-orange drink</td>
<td>$2.40</td>
<td>$9.60</td>
</tr>
<tr>
<td>2</td>
<td>cs. Creamed Corn</td>
<td>$7.20</td>
<td>$14.40</td>
</tr>
</tbody>
</table>
UNIT III D Accounts Payable

Objective: To read and write invoices.

Directions: Use the purchase order form to make an invoice of items to be purchased. The invoice is to include:

- Name and address of purchaser
- An invoice number
- Date
- Items bought, unit & total cost
- Total of the invoice - include 4% wholesale tax
- Terms

Send the wholesale company a check for the amount due.
UNIT III D Accounts Payable

Objective: To learn to compute cash discounts

Directions: To encourage buyers to make a payment as quickly as possible, wholesalers offer cash discounts. Terms 3/10, n/30 mean that the buyer will have a 3% discount if payment is made within 10 days. If the buyer does not wish to pay quickly, he/she must pay the full amount within 30 days.

Answer the following problems:

Example: On April 5, goods were sold for $450, terms 3/15, n/30.

1. By what date must the items be paid to get the discount? April 5 + 15 days is April 20.
2. How much is the cash discount? $450 x.03
   $13.50 cash discount
3. How much must the buyer pay if payment is made on April 15?
4. What is the last date for payment without the discount? May 5

   April 5    -    April 30    25 days
   May 1    -    May 5         5 days
   30 days

For each of the problems, answer the following questions:

a. By what date should payment be made to obtain a cash discount?
b. How much is the cash discount?
c. How much must the buyer pay if the discount is taken?
d. On what date is payment due in full if the discount is not taken?
<table>
<thead>
<tr>
<th>Date of Sale</th>
<th>Terms</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. August 19</td>
<td>2/10, n/30</td>
<td>$500.00</td>
</tr>
<tr>
<td>2. August 19</td>
<td>3/15, n/30</td>
<td>375.00</td>
</tr>
<tr>
<td>3. July 1</td>
<td>2/15, n/30</td>
<td>360.00</td>
</tr>
<tr>
<td>4. February 8</td>
<td>3/10, n/30</td>
<td>462.00</td>
</tr>
<tr>
<td>5. December 19</td>
<td>2/10, n/60</td>
<td>125.00</td>
</tr>
<tr>
<td>6. May 12</td>
<td>3/15, n/30</td>
<td>235.00</td>
</tr>
<tr>
<td>7. March 21</td>
<td>2/10, n/60</td>
<td>658.50</td>
</tr>
<tr>
<td>8. June 26</td>
<td>3/15, n/60</td>
<td>956.50</td>
</tr>
<tr>
<td>9. December 8</td>
<td>2/10, n/60</td>
<td>1521.00</td>
</tr>
<tr>
<td>10. April 22</td>
<td>3/10, n/60</td>
<td>1250.00</td>
</tr>
</tbody>
</table>
UNIT III D Accounts Payable

Objective: To compute dollar cost of credit.

Directions: Find the dollar cost of credit for each of the following problems.

Example: A loan of $525 is paid back in 10 monthly payments of $55 cash. How much does the borrower pay for credit?

\[ \$55 \times 10 = \$550 \]
\[ \text{ } - \$525 \]
\[ \$25 \text{ Dollar cost of credit} \]

Find the dollar cost of credit:

1. A radio for $39.95 cash purchased at $4 a month for 11 months.
2. A bicycle for $129.95 purchased at $12 a month for 1 year.
3. A television set for $179.95 cash purchased at $23.95 for 9 months.
4. A 1970 Volkswagon for $1,000.00 cash purchased at $70 a month for a year and a half.
5. A cash register for $795.95 cash purchased at $110 a month for 8 months.
UNIT III D Accounts Payable

Objective: To compute interest charge using the simple interest formula.

Directions: Using the formula \( i = p \times r \times t \), find the interest charge on the following problems. In this formula "\( i \)" is the interest; "\( p \)" is the principal or amount borrowed, "\( r \)" is the rate at which the interest is to be paid; "\( t \)" is the time for which the money is borrowed.

Example: Mr. Brown borrowed $200 and repaid the loan in 1 month at a rate of 3% per month. What was the amount of interest paid?

\[
\begin{align*}
\text{\$200} \\
\times 0.03 \\
\text{\$6.00 - interest paid}
\end{align*}
\]

Find the amount of interest for each loan:

1. $250 loan with interest at 1% a month repaid at the end of 3 months.
2. $500 loan with interest at 5% a month repaid at the end of 2 months.
3. $1000 loan with interest at 12% a year repaid in 2 years.
4. $60 loan with interest at 2% a month repaid at the end of one month.
5. $450 loan with interest at 5% a month repaid at the end of 5 months.
UNIT III D Accounts Payable

Objective: To find interest rate using the simple interest formula.

Directions: Using the formula \( r = \frac{i}{pt} \), find the rate of interest for the following problems.

Example: A $300 loan was repaid in a single payment at the end of 4 months with an interest charge of $18. What was the monthly rate?

\[
\frac{18}{300 \times 4} = \frac{18}{1200} = .015, \text{ or } 1\frac{1}{2}\%.
\]

Find the monthly interest rate for each single payment loan:
1. $300 loan for 6 months with an interest charge of $30.
2. $500 loan for 3 months with an interest charge of $15.
3. $1000 loan for 8 months with an interest charge of $40.
4. $1500 loan for 3 months with an interest charge of $90.
5. $1500 loan for 1 month with an interest charge of $30.
UNIT III D Accounts Payable

Objective: To compute monthly payments on loans.

Directions: Use your invoices on goods to be purchased.

Compute: 1. Total cost of merchandise to get a loan.
2. Use a simple interest rate of 18.5% to be repaid in 2 years.
3. Find the monthly payments.

Solution: Loan x .185 = interest
(Loan + interest) / 12 = monthly payments

Keep this for a monthly expense to be added in Unit IV.
A. Learner Objectives

1. Estimates and rounds off numbers to designated values.
2. Adds, subtracts, multiplies and divides decimals.
3. Reads and interprets tables.
4. Solves percent problems.
5. Investigates how and who uses percents.
6. Understands and uses relationship between common, decimal and percent fractions.
7. Understands and uses ratios and proportions.

B. Payroll -- In this section, students learn to compute their earnings, in terms of hourly rates, commission, straight salary, and piecework earnings. The students will work with time sheets and will learn to compute gross earnings. They will also compute annual earnings.

1. Review of Skills Needed
   a. Adding, subtracting, multiplying and dividing fractions.
   b. Computing time
   c. Computing hourly rate
   d. Computing commission
   e. Computing salary
   f. Computing earnings from piecework

2. Resources
   a. Time
      1) Bernstein, TROUBLE-SHOOTING MATHEMATICS SKILLS, pp. 188-190, and 210-244
      2) Bolster, MATHEMATICS IN LIFE, pp. 131-170
3) Bolster, CONSUMER and CAREER MATHEMATICS, pp. 14-19 and 50-53
4) Brown, GENERAL MATHEMATICS Bk I, pp. 127-164 and 409-412
5) Brown, GENERAL MATHEMATICS Bk. 2, pp. 148-169
6) Brown, INTRODUCTION TO HIGH SCHOOL MATHEMATICS, pp. 126-164
7) Couzins, ESSENTIALS OF MATHEMATICS, pp. 90-155, and 188-221
8) Goe, CONSUMER MATHEMATICS, pp. 420-432
9) Olson, BUSINESS and CONSUMER ARITHMETICS, pp. 13-18
10) Shaw, GENERAL MATH 1, pp. 97-184, 289-213
11) Shea, WORKING WITH NUMBERS, pp. 26-55 and 107-116
12) Wiebe, FOUNDATIONS OF MATHEMATICS, pp. 416-435

b. Others

1) Bernstein, TROUBLE-SHOOTING MATHEMATICS SKILLS, pp. 332-345
2) Bolster, CONSUMER and CAREER MATHEMATICS, pp. 68-86
3) Brown, GENERAL MATHEMATICS Bk. I, pp. 405-434
4) Brown, GENERAL MATHEMATICS Bk. 2, pp. 98-137
5) Dublin, BUSINESS MATHEMATICS, pp. 80-89
6) Goe, CONSUMER MATHEMATICS, pp. 159-1954
7) Guthrie, BUSINESS MATHEMATICS for the CONSUMER, p. 237
8) Kinney, GENERAL MATHEMATICS, pp. 468-478
9) Meyer, CONSUMER and BUSINESS MATHEMATICS, pp. 41-47
10) Olson, BUSINESS and CONSUMER ARITHMETIC, pp. 107-112
11) Shaw, GENERAL MATH 1, pp. 70-90
3. Suggested Activities

a. Set up a daily work schedule with a minute wage. You may start at 50¢ per minute and increase 5¢ a week.

b. Give each student a time card each week.

c. Assign the job of timekeeper to a student who will collect the time cards daily for you to check.

d. Use the first 15 minutes of the first class period of the week to compute earnings.

e. Use the sample time cards or one similar.

f. Use the following sample worksheets
UNIV B Payroll

Objective: To compute earnings at an hourly rate

Directions: Use the time sheets on this page and compute the amount earned for the week.

1 minute to 15 minutes late cost the worker 15 minutes.
16 minutes to 30 minutes late cost the worker 30 minutes, etc.
Working hours are from 6:30 AM to 10:30 AM and 11 a.m. to 3 PM.

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<th>Rate</th>
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<th>In</th>
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<td></td>
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<td></td>
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<td></td>
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<td>DANIELLE</td>
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</table>
UNIT IV & Payroll

Objective: To compute minutes worked from a time sheet.

Directions: Your teacher will give you a time sheet (Sample 4) the first day of each week. Use this time sheet to keep a record of your working minutes in class. Give your time sheet to the assigned time keeper at the end of each class.

See Sample 5.
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</tr>
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<table>
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<td>F</td>
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SAMPLE 5

<table>
<thead>
<tr>
<th>NAME</th>
<th>Mary Lee</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEEK</td>
<td>9/5 - 9/9</td>
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<table>
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<td>T</td>
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<table>
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<tr>
<th></th>
<th>50</th>
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<tbody>
<tr>
<td></td>
<td>85 min.</td>
<td>60 min.</td>
</tr>
<tr>
<td></td>
<td>73 min.</td>
<td>218 min.</td>
</tr>
</tbody>
</table>

80 80
UNIT IV B Payroll

Objective: To compute gross earnings

Directions: Use your completed time sheet and compute your gross earnings. Your beginning pay will be 50c/min. for the first 180 minutes and time and a half will be used for every minute over 180 minutes.

Example: Using Mary Lee's time sheet:

\[
\begin{array}{ccc}
218 & 180 & 38 \\
- 180 & \times .50 & \times .75 \\
38 \text{ overtime} & 90.00 & 190 \\
27.50 & 266 & 27.50 \\
117.50 & & \\
\end{array}
\]

Mary Lee's gross earning is $117.50
UNIT IV B  Payroll

Objective:  To compute hourly rate from gross annual salary.

Directions: Use the classified section of the Sunday newspaper find 10 jobs that advertise an annual salary. Compute the weekly earning and an hourly rate using a 40 hour work week.

Example: Manager earning $13,000 annually.

\[
\begin{array}{c}
250.000 \\
52) 13,000.000 \\
10 \ 4 \\
260 \\
260 \\
\end{array}
\]

\[
\begin{array}{c}
\text{\$250.00 a week} \\
\text{- \$6.25 a hour}
\end{array}
\]
UNIT IV B Payroll

Objective: To compute gross earnings using a salary plus commission.

Directions: Employers use various methods to encourage their employees to do their best. Some firms (especially sales firms) pay a salary plus a commission to their sales people. Compute the gross earnings for the following problems.

Example: George receives a salary of $100 a week plus commission of 10% on sales. If he sold $470 worth of shoes during the week, what was his gross earnings?

- $100 Salary
- 10% of $470 = $47.00 Commission
- $147 Total Earned

1. Alfred receives a salary of $33 plus a commission of 25% on sales. If he sold $700 worth of beef during that week, what was his gross earnings?

2. Daniel receives a 12% commission only on all of his drug sales to the various Super Markets and Drugstores. Daniel sold $1568 worth of drugs this week. What was his earnings for the week?

3. Jerry receives the commissions:
   - Sales up to $50 5% commission
   - Sales in excess of $50 up to $100 8%
   - Sales in excess of $100 12%
Find his commission during each week:

First week: Sales $40
Second week: Sales $75
Third week: Sales $90
Fourth week: Sales $125

If Jerry receives a salary of $100 each week plus his commissions from above, how much did Jerry earn for the four weeks selling hardware?
Objective: To compute earnings from piecework.

Directions: Some employers pay their workers according to jobs completed.

Example: Suzie Sewing Company pays a cutter $1.25 for each outfit cut during the day. If the cutter cut 16 outfits on Monday, 15 outfits on Tuesday, 20 outfits on Wednesday, 10 outfits on Thursday and 12 outfits on Friday, how much did the cutter earn?

\[
\begin{array}{ccc}
16 & \times & 1.25 \\
15 & \times & 73 \\
20 & \times & 375 \\
10 & \times & 875 \\
12 & \times & 73 \\
\hline
73 & \hline
\end{array}
\]

\[16 \times 1.25 + 15 \times 73 + 20 \times 375 + 10 \times 875 + 12 \times 73 = 91.25 \text{ was the total earned.}\]

Compute the earnings for the following problems:

1. Lisa is paid $9 for each poster used in the Super Market. Lisa made 4 posters for the Produce Department, 3 posters for the Meat Department, 5 posters for the Grocery Department and 7 for the Drug Department. Two drug posters were not approved, but the rest were put up in the supermarket. How much did Lisa earn?

2. Karen gets paid 12c for each pineapple picked during the day and gets a bonus of 2c for each pineapple picked in excess of 1000 for the week. Karen picked 250 pines on Monday, 180 pines on Tuesday, 225 pines on Wednesday, 230 pines on Thursday and 50 pines on Friday. What was her earnings for the week?

3. Thomas gets paid 65c a pound for akule, 89c a pound for aku and 125 pound akule, 3 akus weighing 25 lb., 37 lb. and 15 lb. and 1 ahi weighing 90 lbs. How much did he earn?
C. Taxes -- In this section, students will compute different types of taxes such as income, property, and sales tax. They will be using tables or using percents to compute these taxes.

1. Review of Skills Needed
   a. Income tax
      1) Federal
      2) State
      3) FICA
   b. Property tax
   c. Sales tax

2. Resources
   b. Bolster, CONSUMER and CAREER MATHEMATICS, Pages 260-279.
   d. Coe, CONSUMER MATHEMATICS, Pages 195-240.
   e. Guthrie, BUSINESS MATHEMATICS for the CONSUMER, Pages 212-236.
   g. Meyer, CONSUMER and BUSINESS MATHEMATICS, Pages 63-86.
   h. Olson, BUSINESS and CONSUMER ARITHMETIC, Pages 89-92.

3. Suggested Activities
   a. Obtain a table from the Federal and State governments to use for computation.
   b. Check requirements for retail license.
   c. Check for method of paying sales tax.
   d. Check with State and/or City about property taxes.
   e. Obtain a table from the Social Security Administration to use for computation.
   f. Use the following sample worksheets.
UNIT IV C Taxes

Objective: To read and use tables.

Directions: Use the Federal and State Tax tables to compute the amount of income tax that will be deducted from the gross income that you have computed.

Compute the Social Security tax based on the recent percentage that each person must contribute.

Obtain state income tax information from:

Employer's Tax Guide
State Tax Office
425 South Queen Street
Honolulu, HI 96813
Phone: 548-3270 (Oahu)

Obtain federal income tax and social security tax information from:

Employer's Tax Guide
Internal Revenue Service
Phone: 546-99 (Oahu)
UNIT IV C Taxes

Objective: To use percents in computing property tax.

Property taxes are based on assessed valuation. Assessed valuation is 60% of market value. A notice of property assessment is sent to the owner each year showing the value of the building, land and the total value minus exemptions, if any, showing total net taxable.

Directions:
1. Obtain a notice of property assessment from your parents.
2. Call the Department of Taxation at 548-3274 (Oahu) and inquire about the mill levy for the various land classes.
3. Compute the amount of taxes to be paid.

Example: Assessed value of the Browns property is $30,264.

The total mill levy is 41.610 mills per dollar.

Find the amount of their property tax.

Solution: To change mills per dollar to a dollar amount, divide the number of mills per dollar by 1000.

Property Tax = Assessed value \times \text{Rate}

\[
\begin{align*}
30,264 & \times 0.04161 \\
30,264 & \\
181584 & \\
30,264 & \\
121056 & \\
1259.28504 & = 1259.29
\end{align*}
\]
UNIT IV  EXPENSES  
(Continued)

D. Insurance -- In this section, students will learn about different types of insurance. They will learn about the purpose of each type of insurance and how to obtain information regarding each type of insurance. They will learn to compute how much insurance costs and how much they saved because they bought insurance. Finally, they will be able to compute their personal expense after insurance has paid those partial expenses covered by the particular type of policy.

1. Review of Skills Needed
   a. Purpose
   b. Medical
   c. Liability
   d. Property
   e. Contents
   f. Workmen's Compensation
   g. Life

2. Resources
   b. Bolster, CONSUMER and CAREER MATHEMATICS, Pages 280-300.
   d. Dublin, BUSINESS MATHEMATICS, Pages 100-104.
   e. Goe, CONSUMER MATHEMATICS, Pages 331-368.
   g. Meyer, CONSUMER and BUSINESS MATHEMATICS, Pages 87-102.
   h. Olson, BUSINESS and CONSUMER ARITHMETIC, Pages 81-88, 93-98.

3. Suggested Activities
   a. Invite one or two insurance agents to help with services and cost. From information, students can select insurance needed and compute accordingly.
   b. Inquire about the State Workmen's Compensation Laws.
   c. Use the following sample worksheets.
UNIT IV D Insurance

Objective: To obtain pertinent information for insurance.

Directions: Ask your family's insurance agent or one that will visit your class for information and complete each blank.

What is the cost of:
- Fire Insurance:
- Real Property Insurance:
- Personal Property Insurance:
- Life Insurance:
- Contents Insurance:
- Medical Insurance:
UNIT IV D Insurance

Objective: To figure amount of money saved repairing a damaged home by obtaining a loan versus having insurance.

Insurance is a pooling of money of a large number of people. When an accident occurs, some of the money is used to help pay some of the costs.

Example: A fire caused $30,000 worth of damage to a home. If the family borrowed the money to repair the house, they must repay the loan at $10 per $1000 of the loan per month over 20 years. If the home had been insured at $200 per year, how much would the owners have saved?

Solution: $30 x $10 = $300 per month
           300 x 12 = 3600 annually
           3600 x 20 = 72,000 over the 20 years.

At $200 a year, over a 20 year period, they would have paid $4000 for insurance.

Thus they would save

$72,000 (loan) - $4,000 (insurance)

$68,000 over the 20 years
UNIT IV D  Insurance

Objective: To obtain information for Medical Insurance.
There are two Medical Plans in Hawaii, Hawaii Medical Services Association and Kaiser Foundation Medical Plan, besides the Insurance Companies.

Directions: Obtain medical plans from both services and compute cost of insurance for your immediate family per month and annually. Make a schedule of benefits for each Plan.
UNIT IV D Insurance

Objective: To compute hospital and physician expenses with insurance.

Directions: Use your Medical Benefits Schedule to compute the following problems.

1. What is the cost of a room for 90 days at $98 a day?
2. How much will be paid by the insurance plan?
3. Find the cost of a private room for 40 days at $125 a day.
4. How much of this cost will be paid by the insurance plan?
5. Jerry spent 10 days in the hospital for an operation. His room cost $100 a day. The doctor's bill was $500. X-rays cost $42 and the anesthetic cost $95. Other hospital costs totaled $550.00. How much did Jerry pay?
UNIT V  SUMMARIZATION  (1 week)

A. Learner Objectives

1. Compiles material for a course notebook.
2. Finds averages for grades received.

B. Post - Test Administer the Stanford Diagnostic Mathematics Test as a post test.

C. Course Notebook -- Students should compile a notebook (see attached worksheet for instructions). They should average all quizzes, classwork, and homework grades (see attached worksheet for instructions). Students can also make a layout and/or model of the chosen department using empty cans or boxes to construct shelf of their goods. This shelf can be a good display for a school fair or office. Students can also make a floor plan of their department to scale or draw a shelf to display in the library or office.
UNIT V C Summarization

Directions: Get all of your work done for Math class and arrange them in order of the four (4) units:

I: ORIENTATION
II: PURCHASING AND PRICING OF GOODS
III: BOOKKEEPING
IV: EXPENSES

Include all of the worksheets, scratch paper, quizzes, tests, checkbook, inventory and ledger.
UNIT V C Summarization

Objective: To compute averages

Directions: Obtain all of your class and homework grades and compute the average. Be sure to include your zeroes (0) for all work not completed. Compute an average for your quizzes.

Examples: 95, 68, 85, 100, 55, 75, 85, 100, 100, 0, 0, 0.

There should be 12 grades, thus:

\[
\begin{align*}
95 & \quad 68 & \quad 85 & \quad 100 & \quad 55 & \quad 75 & \quad 85 & \quad 100 & \quad 100 & \quad 0 & \quad 0 & \quad 0 \\
12 & \quad \frac{763}{72} & \quad \frac{72}{43} & \quad \frac{36}{7} & \quad \text{class/homework average is 64}
\end{align*}
\]
Following is a list of all texts and workbooks that might be of some use to you. Your basal text may be one or more of the texts listed or you may have some that are not listed.

Textbooks
Dumas, E & Schminke, C., MATH ACTIVITIES FOR CHILD INVOLVEMENT, Allyn and Bacon, Inc., 1977.
Wells, Shult, Choate, MATHEMATICS FOR DAILY USE, LaIdlaw Brothers, 1977.

Workbooks
Bell, E & Gawronski, J., MASTERING COMPUTATIONAL SKILLS, Level 7,8,9 Scott, Foresman and Company, 1979.